"aramid". The term "aramid" has also been inserted in the specification on page 7, which is the first occurrence of the term "Kevlar".

Claim Rejections - 35 USC 102 and 103

2. Claims 1-3 and 6-8 have been rejected under 35 USC 102(b) as being anticipated by, or, in the alternative, under 35 USC 103(a) as obvious over Japanese 61-69437 (J-437).

J-437 discloses a tire having a tread "belt layer composed of uncured reinforced plastic", rather than applicant's "carcass ply extending between the beads and consisting of reinforcement cords embedded in a rubber matrix..." formed "from a matrix material that can be rendered plastic and rendered non-plastic" (claim 1). As best as can be determined from the limited description of J-437, they are not only referring to a completely different tire component, but are also using the term "plastic" as a noun which is a generic term for a variety of synthetic materials that are curable in a vulcanizing mold. According to the "constitution" section of J-437: the "uncured reinforced plastic is elongated...and is heated and cured" in the vulcanizing mold. Apparently once it is cured, the reinforced plastic is no longer elongatable. This is in contrast to the present invention wherein applicant describes a material, preferably a thermoplastic material, that has *properties of plasticity* that can be made to vary. Thermoplastics are known to exhibit plasticity that varies repeatedly with temperature.

Applicant acknowledges that the original independent claims 1 and 13 were written in a generalized way that allowed confusion about the nature of the material. Therefore applicant herewith submits amended claims 1 and 13 that are more specific in language to avoid confusion. In particular, claim 3 is deleted and the content of claim 3 has been combined in the amended claim 1 so that the matrix material is specified as "a thermoplastic having a deflection temperature above which the thermoplastic matrix material is plastic, and below which the thermoplastic matrix material is non-plastic", and the step b) includes the limitation that rendering the matrix material plastic is accomplished by "heating the thermoplastic matrix material to a temperature above the deflection temperature." (The definition of deflection temperature is taken from page 15, lines 24-26.) The words: "relative to other materials or components of the tire" have been moved from step a) to step b).

As a logical consequence of the changes to claim 1, the term "matrix material" has been replaced with "thermoplastic matrix material" throughout the claims.

Other than obvious grammatical and punctuation changes in claim 1, the term "bead portions" used in claim 9 is given an antecedent by defining the term in claim 1.

Dependent claim 2 is amended to specify that cooling is used to render the --thermoplastic-- matrix material non-plastic.

Dependent claim 3 is deleted (content moved to claim 1).

Dependent claim 4 has dependency appropriately changed to claim 1.

Dependent claim 5 is unchanged.

Dependent claim 6 has dependency appropriately changed to claim 1, and the description of step b) is updated according to the amendments of claim 1.

A new claim 19, depending from claim 1 can be positioned logically between claims 6 and 7 since it parallels claim 6 with the alternative of heating the thermoplastic matrix material before placing the tire in the tire mold (see page 16, lines 5-12).

Dependent claim 7 has dependency appropriately changed to claim 1, and a description of the "co-curable" nature of the claimed thermoplastic matrix material is appended to the claim in order to clarify the meaning of the term "vulcanizable thermoplastic". This is important in order to distinguish the claimed invention from the prior art "curable plastic" of J-437. The appended material is supported by the detailed description on page 15, line 30 through page 16, line 2.

Dependent claim 8 is amended as described in paragraph 1hereinabove.

Dependent claims 9-10 have obvious terminology and punctuation changes.

Dependent claim 11 is amended to correct the description of step b). Also, the "component of the tire" term is replaced by the more specific term "bead", copied from claim 12. The general term "component of the tire" is redundant of the language in claim 1.

Dependent claim 12 is deleted since it is covered by the amended claim 11.

3. Dependent claims 4 and 5 were rejected under USC 103(a) as being unpatentable over J-437 for the same reasons stated in paragraph 2 with the added assumption that a "deflection temperature" did not need to be stated in J-437 since it would be known. As argued by applicant hereinabove, J-437 is most likely claiming a plastic type of material, but probably *not* a thermoplastic, therefore the curable plastic of J-437 may have a curing temperature, as implied, but *not* a deflection temperature such as the deflection temperature claimed by applicant. Thus claims 4 and 5 remain as reasonable limitations on the novel and unobvious invention claimed in independent claim 1.

4. Claims 9-18 were rejected under USC 103(a) as being unpatentable over J-437 in view of PCT Publication WO 00/11445 (PCT-445).

Claims 9-12, depending from the independent claim 1 amended as described hereinabove,

should be allowable as limitations of an independent claim that applicant believes to be allowable. Amendments to claims 9-12 are detailed hereinabove.

Independent claim 13 is herewith submitted in an amended form, wherein the amendments substantially parallel the amendments of claim 1 discussed hereinabove, and are intended to have the same effect of clarifying and further distinguishing the invention from the disclosure of J-437. The most significant changes to claim 13 comprise limiting the "material that can be rendered plastic and rendered non-plastic", to now read: "thermoplastic material having a deflection temperature above which the thermoplastic material is plastic, and below which the thermoplastic material is non-plastic". The new limitation, replacing "material" with "thermoplastic material" is carried forward throughout the rest of claim 13 and its dependent claims, as appropriate. Other changes in claim 13 correct grammar and punctuation, or copy appropriate language from claim 1 to make the two claims more closely parallel in language.

Dependent claim 14 has been amended to make the description of step b) updated according to the amendments of claim 13.

A new claim 20, depending from claim 14 can be positioned logically between claims 14 and 15. The claim 20 further limits the heated portion of the tire of claim 14 as supported by the detailed description on page 17, lines 14-15.

Dependent claim 15 has obvious grammatical changes, but is substantially unchanged.

Dependent claim 16 is logically modified in light of the changes in claim 13, and a description of the "co-curable" nature of the claimed thermoplastic material is appended to the claim in order to clarify the meaning of the term "vulcanizable thermoplastic", as discussed hereinabove with reference to claim 7.

Dependent claim 17 is not amended.

Dependent claim 18 has been amended to appropriately change the description of the matrix material in the carcass ply in the same way that it was changed in the amended claim 1 discussed hereinabove.

5. Other references are cited on the 892 form stating that uncured rubber is plastically deformable. Applicant respectfully submits that this disclosure is moot in light of the amendments to the claims discussed hereinabove, since rubber is not a thermoplastic material in the sense claimed by the present invention, as amended.

CONCLUSION

Separate sheets showing the changes to the specification and claims are enclosed. Favorable re-examination and consideration are respectfully requested.

Respectfully submitted,

Howard M. Cohn
Registration No. 25,808

Howard M. Cohn
c/o Bruce Hendricks Dept. 823
The Goodyear Tire & Rubber Company
1144 East Market Street
Akron, Ohio 44309-3531
Voice (216) 752-0955
Fax (216)752-0957

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Signature of Person Mailing :

Date of Signature : March 13, 2002

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In re	:	Application of Brown et al.
For	:	**TIRE CONSTRUCTION METHOD FOR IMPROVING TIRE UNIFORMITY**
Serial No.	:	09/545,929
Filed	:	April 10, 2000
Group Art Unit	:	1732
Examiner	:	Mathieu D. Vargot
Our Docket No.	:	DN2000-067

SEPARATE SHEET(s)

marked up to show change(s) made to the paragraph beginning on page 7, line 23

If the matrix material is a thermoplastic, its deflection temperature is preferably above 30 degrees C, and more preferably between 121-190 degrees C. Heating of the thermoplastic can occur while within the mold. The thermoplastic can be sulfur vulcanizable, semi-sulfur vulcanizable or non sulfur vulcanizable thermoplastics. The reinforcement cords can be aramid (e.g., Kevlar™), steel, rayon, polyester or nylon.

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CLAIMS

1. (AMENDED) A method of manufacturing a pneumatic tire with improved tire uniformity; the tire having a pair of spaced beads in bead portions, and at least one carcass ply extending between the beads and consisting of reinforcement cords embedded in a rubber matrix; the method being characterized by the steps of:

a) forming the rubber matrix from a matrix material that is a thermoplastic having a deflection temperature above which the thermoplastic matrix material is [can be rendered] plastic, and below which the thermoplastic matrix material is [and rendered] non-plastic;~~,~~ [which respectively permits and restricts reorientation of one or more of the reinforcement cords relative to other materials or components of the tire;]

b) heating the thermoplastic matrix material to a temperature above the deflection temperature to render[ing] the thermoplastic matrix material plastic before the tire begins to cure and thereby to permit [the] one or more of the reinforcement cords to be unrestricted and free to reorient themselves relative to other materials or components of the tire; and

c) curing the tire in a tire mold while the thermoplastic matrix material remains plastic so that the reinforcement cords remain unrestricted and free to reorient themselves [while] during the curing within the mold so that the reinforcement cords maintain or attain a uniform tension.

2. (AMENDED) Method, according to claim 1, characterized by the step of:

cooling the thermoplastic matrix material to a temperature below the deflection temperature to render[ing] the thermoplastic matrix material non-plastic and thereby to restrict further reorientation of the one or more reinforcement cords subsequent to removing the tire

from the tire mold.

[3. Method, according to claim 1, characterized by the step of:

selecting the matrix material to be a thermoplastic having a deflection temperature;

the step of rendering the matrix material plastic includes the step of heating the matrix material to a temperature above the deflection temperature; and

the step of rendering the matrix material nonplastic includes cooling the matrix material to a temperature below the deflection temperature.]

4. (AMENDED) Method, according to claim 1[3], wherein:

the deflection temperature is above 30 degrees C.

5. Method, according to claim 4, wherein:

the deflection temperature is between 121 degrees C and 190 degrees C.

6. AMENDED Method, according to claim 1~~3~~, wherein the step b) of [rendering the matrix material plastic] heating the thermoplastic matrix material includes:

heating the tire in the tire mold to above the deflection temperature to permit reorientation of the one or more reinforcement cords [while]as the tire begins curing within the mold.

7. (AMENDED) Method, according to claim 1[3], wherein:

the thermoplastic matrix material is selected from the group consisting essentially of sulfur vulcanizable, semi-sulfur vulcanizable and non sulfur vulcanizable thermoplastics, so that the thermoplastic matrix material is co-curable with surrounding rubber materials of the tire, wherein:

co-curing means cross bonding at interfaces of the thermoplastic matrix material and the surrounding rubber material such that the thermoplastic matrix material maintains thermoplastic properties in the rest of its volume even after cross bonding is completed and the surrounding rubber material is vulcanized.

8. (AMENDED) Method, according to claim 1, wherein:

the reinforcement cords are selected from the group comprising [Kevlar] aramid, steel, rayon, and nylon.

9. (AMENDED) Method, according to claim 1, including the step of:

forming at least a portion of the bead portions from the thermoplastic matrix material.

10. (AMENDED) Method, according to claim 9, wherein:

the thermoplastic matrix material [is-a thermoplastic and] is disposed between a bead and an adjacent portion of the carcass ply.

11. (AMENDED) Method, according to claim 10, wherein:

the step b) of rendering the thermoplastic matrix material plastic permits the one or more reinforcement cords to slip with respect to a [component of the tire] bead.

[12. Method, according to claim 11, wherein the step of rendering the material plastic permits the one or more reinforcement cords to slip with respect to a bead.]

13. (AMENDED) A method of manufacturing a pneumatic tire for improving one or more tire uniformity characteristics, the tire having a pair of spaced beads in bead portions, and at least one carcass ply having a plurality of reinforcement cords and extending between the beads;[, for improving one or more tire uniformity characteristics,] the method being characterized by the steps of:

a) forming at least a portion of the bead portions from a thermoplastic material [that can be rendered] having a deflection temperature above which the thermoplastic material is plastic[and rendered]and below which the thermoplastic material is non-plastic; [to respectively permit and restrict reorientation of one or more reinforcement cords relative to other reinforcement cords or components of the tire before the tire has been at least partially vulcanized;]

b) heating the thermoplastic material to a temperature above the deflection temperature to render~~ing~~ the thermoplastic material plastic before the tire begins to cure and thereby to permit the plurality of reinforcement cords to be unrestricted and free to reorient themselves relative to other reinforcement cords or other components of the tire; and

c) curing the tire in a tire mold while the thermoplastic material remains plastic so that one or more of the plurality of reinforcement cords can reorient themselves during the curing within the mold so that the plurality of reinforcement cords maintain or ~~acquire~~ attain a uniform tension.

14. (AMENDED) Method, according to claim 13, wherein the step b) of heating the thermoplastic material [rendering the material plastic] includes:

heating portions of the tire to above [a]the deflection temperature to permit reorientation of the one or more reinforcement cords.

15. (AMENDED) Method, according to claim 14, wherein:

reorienting of the one or more reinforcement cords includes ~~the step of~~ slipping of

the one or more reinforcement cords with respect to the bead.

16. (AMENDED) Method, according to claim 15, wherein:

the thermoplastic material [is selected from a thermoplastic material having] has a deflection temperature between 30 degrees C and 190 degrees C; and

the thermoplastic material is selected from the group consisting essentially of sulfur vulcanizable, semi-sulfur vulcanizable and non sulfur vulcanizable thermoplastics, so that the thermoplastic material is co-curable with surrounding rubber materials of the tire, wherein:

co-curing means cross bonding at interfaces of the thermoplastic material and the surrounding rubber material such that the thermoplastic material maintains thermoplastic properties in the rest of its volume even after cross bonding is completed and the surrounding rubber material is vulcanized.

17. Method, according to claim 16, including:

disposing the thermoplastic material at least partially around the beads to form a thermoplastic layer.

18. (AMENDED) Method, according to claim 13, further including:

forming the at least one carcass ply from a plurality of reinforcement cords embedded in a matrix material that is a thermoplastic having a deflection temperature above which the thermoplastic matrix material is plastic, and below which the thermoplastic matrix material is non-plastic.[can be rendered plastic and rendered non-plastic.]

19. (NEW) Method, according to claim 1, wherein the step b) of heating the thermoplastic matrix material includes:

before placing the tire in the tire mold, heating the thermoplastic matrix material to above the deflection temperature to permit reorientation of the one or more reinforcement cords before the tire begins curing.

20. (NEW) Method, according to claim 14, wherein:

at least a part of a bead portion is heated to above the deflection temperature.